

CLAIMS:

1. A method for processing a substrate, comprising:
 - a) positioning a substrate having a first conductive material disposed thereon in a processing chamber containing an electrochemical bath;
 - b) depositing a second conductive material on the first conductive material as the conductive material is contacted with the electrochemical bath by applying a plating bias to the substrate while immersing the substrate into the electrochemical bath; and
 - c) depositing a third conductive material in situ on the second conductive material by an electrochemical deposition technique to fill the feature.
2. The method of claim 1, wherein applying the bias to the substrate comprises applying a voltage of between about 0.8 volts and about 20 volts.
3. The method of claim 1, wherein the bias is applied for a period of time between about 0.1 seconds and about 4 seconds.
4. The method of claim 1, wherein applying the bias to the substrate comprises applying a voltage of between about 5 volts and about 20 volts for a period of time between about 0.5 seconds and about 2 seconds.
5. The method of claim 1, wherein electrochemical deposition technique comprises a pulse plating technique.
6. The method of claim 1, wherein applying the bias to the substrate comprises exposing the substrate to a charge density between about 20 mA*sec/cm² and about 160 mA*sec/cm².
7. The method of claim 1, wherein the first, second, and third conductive materials are selected from the group of copper, doped copper, copper alloys, and combinations thereof.
8. A method for electrochemically depositing a conductive material into a high

aspect ratio structure on a substrate, comprising:

- a) depositing a seed layer in the high aspect ratio structure on the substrate;
- b) applying a plating bias over the substrate by exposing the substrate to a charge density between about $20 \text{ mA} \cdot \text{sec}/\text{cm}^2$ and about $160 \text{ mA} \cdot \text{sec}/\text{cm}^2$ while immersing the substrate into an electrochemical bath to deposit a patching layer in the high aspect ratio structure; and
- c) depositing a conductive material on the patching layer in situ to fill the high aspect ratio structure.

9. The method of claim 8, wherein the charge density comprises applying a voltage of between about 0.8 volts and about 20 volts for a period of time between about 0.1 seconds and about 4 seconds.

10. The method of claim 8, wherein the seed layer, the patching layer, and the conductive materials are selected from the group of copper, doped copper, copper alloys, and combinations thereof.

11. A method for filling a high aspect ratio structure on a substrate in an electrochemical bath, comprising:

- a) providing a substrate having discontinuous conductive layers formed thereon;
- b) reducing the formation of discontinuous conductive layers and minimizing agglomeration of subsequently deposited conductive material while immersing the substrate into the electrochemical bath; and
- c) filling the high aspect ratio structure with a conductive material.

12. The method of claim 11, wherein the reduction of the formation of discontinuous conductive layers and minimizing agglomeration of subsequently deposited conductive material comprises applying a plating bias to the substrate while immersing the substrate into an electrochemical bath.

13. The method of claim 12, wherein applying the bias to the substrate comprises applying a voltage of between about 0.8 volts and about 20 volts.

14. The method of claim 12, wherein the bias is applied for a period of time between about 0.1 seconds and about 4 seconds.

15. The method of claim 12, wherein applying the bias to the substrate comprises applying a voltage of between about 5 volts and about 20 volts for a period of time between about 0.5 seconds and about 2 seconds.

16. The method of claim 12, wherein filling the high aspect ratio structure with a conductive material comprises a pulse plating technique.

17. The method of claim 16, wherein the electrochemical deposition technique comprises a pulse plating technique.

18. The method of claim 12, wherein applying the bias to the substrate comprises exposing the substrate to a charge density between about 20 mA*sec/cm² and about 160 mA*sec/cm².

19. The method of claim 18, wherein the charge density is selected based upon the amount of material to be deposited.

20. The method of claim 1, wherein the charge density is selected based upon the amount of second conductive material to be deposited.

21. The method of claim 8, wherein the charge density is selected based upon the amount of patching layer material to be deposited.